

Scope of Claims

- 5 1. FRP roofing material comprising a sandwich structure where a pair of sheets comprising FRP is arranged with a gap between them and a rib structure which joins said pair of sheets is interposed.
- 10 2. FRP roofing material according to Claim 1 where the respective thicknesses of said pair of sheets is 2-10 mm.
- 15 3. FRP roofing material according to Claim 1 where the rib structure is FRP and is substantially integrally moulded to the pair of sheets from which the sandwich structure is composed.
- 20 4. FRP roofing material according to Claim 1 where the thickness of the rib is 1-3 mm.
- 25 5. FRP roofing material according to Claim 3 where there is used for the reinforcing fibre of the FRP rib a multiaxial woven material comprising a fibre direction at an angle of  $45 \pm 10^\circ$  to the lengthwise direction of the rib.
6. FRP roofing material according to Claim 1 where the FRP is CFRP.
7. FRP roofing material according to Claim 1 where the FRP is a hybrid FRP of carbon fibre and glass fibre.
- 30 8. FRP roofing material according to Claim 1 where the form of (the reinforcing fibre) is that of a woven material.

- Surf Board*
9. FRP roofing material according to Claim 8 where the carbon fibre woven material is a plain weave or twill weave.
- a.
10. FRP roofing material according to Claim 1 where the spacing of the gap is substantially uniform along the lengthwise direction of the sheets.
- 5
11. FRP roofing material according to Claim 1 where the spacing of the gap varies along the lengthwise direction of the sheets.
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12. FRP roofing material according to Claim 1 where there is arranged, in the gap, a filler of specific gravity lower than that of both the pair of sheets.
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13. FRP roofing material according to Claim 1 where at least one of the sheets has a jagged form in which there are alternately arranged peaks and troughs.
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14. FRP roofing material according to Claim 1 where a rigid frame (Rahmen) structure is arranged in the gap.
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15. FRP roofing material according to Claim 1 where a connecting member for connecting to another member is fitted to the outer face of at least one of the sheets.
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16. FRP roofing material according to Claim 1 where the ratio of the overall thickness of the sandwich structure to the thickness of each of the sheets comprising said pair of sheets lies in the range 5 : 1 to 25 : 1 and, furthermore, the weight of said sandwich structure is no more than 100 kg/m<sup>2</sup>.

- Sub A*
17. FRP roofing material according to Claim 1 where the flexural rigidity per unit width of the sandwich structure is at least  $5 \times 10^7$  kg.mm<sup>2</sup>.
18. FRP roofing material according to Claim 18 which extends in the lengthwise direction at substantially a uniform width, and the flexural rigidity per unit width (1 mm) in the lengthwise direction is at least  $5 \times 10^7$  kg.mm<sup>2</sup>.
- 10 19. FRP roofing material according to Claim 1 where the cross-sectional shape is flat sheet shaped, V-shaped, hat shaped, W-shaped, inverted Y-shaped, corrugated or circular arc shaped.
- 15 20. FRP roofing material according to Claim 1 which extends in the lengthwise direction at substantially a uniform width, and where its dimensions are a length of 10-25 m and a width of 1.5-3.5 m.
- 20 21. FRP roofing material according to Claim 20 where the shape in the lengthwise direction is that of a circular arc.
22. FRP roofing material according to Claim 1 where a plurality of the FRP roofing materials is connected together in the widthwise direction.
- 25 23. FRP roofing material according to Claim 22 where a gap is formed between adjacent FRP roofing materials in the widthwise direction connection.
- 30 24. FRP roofing material according to Claim 23 where the connection region is covered with a waterproof member.

*Spd  
S/15  
Coat*  
10

25. FRP roofing material according to Claim 1 where the matrix resin of at least one of the sheets chiefly comprises a phenolic resin.

5 26. FRP roofing material according to Claim 1 where a fire-resistant material is provided at least on one face.

27. FRP roofing material according to Claim 26 where the fire-resistant material is a fire-resistant material containing rock wool.

28. FRP roofing material according to Claim 26 where the fire-resistant material is a fire-resistant material containing phenolic foam.

15 29. FRP roofing material according to Claim 17 where the thickness of the FRP layer comprising carbon fibre is at least 5% that of the FRP sheet.

20 30. A method of producing FRP roofing material where, in an RTM moulding method in which channels are provided in the core material and the reinforcing fibre impregnated with a resin distributed through these channels, there is used an RTM moulding method employing a core material having through-holes.

25 31. A method of producing FRP roofing material according to Claim 30 which is characterized in that the sum of the areas of the through-holes provided in the core material is from 30 1/100 to 1/5000 of the area of the upper or lower face of the core material.

32. A method of producing FRP roofing material according to Claim 30 which is characterized in that there are provided from 1 to 50 said through-holes per 1 m<sup>2</sup>.

33. FRP roofing material according to Claim 1 where there is a core material in the gap and there are present, in the core material, through-holes running from the upper face to the lower face.

34. FRP roofing material according to Claim 1 which is FRP roofing material where two or more FRP sandwich structures are butt joined and, as well as providing an FRP connecting layer extending across the surfaces of both ends of said sandwich structures, there is provided a layer containing a resin distribution medium between the abutting end faces.

35. FRP roofing material according to Claim 34 where the resin distribution medium comprises a reticular body.

36. FRP roofing material according to Claim 34 where the resin distribution medium comprises a block or sheet-shaped body with a resin injection hole and, furthermore, with resin flow channels formed in the surface.

37. FRP roofing material according to Claim 34 where an FRP layer is provided around the resin distribution medium.

38. A joint structure for a sandwich structure according to Claim 34 where the FRP connecting layer is arranged in hollows formed in the surfaces of the two end regions, and the surfaces of the sandwich structures adjacent to the hollows and the surface of the FRP connecting layer are coplanar.

39. A method for joining FRP roofing materials in which, when butt joining the end regions thereof, as well as arranging a resin distribution medium between the abutting  
5 end faces, reinforcing fibre is arranged across the surfaces of the two end regions and, with the area where the resin distribution medium and the reinforcing fibre are arranged being covered with an airtight material, a vacuum is applied to the interior and a resin injected into the resin  
10 distribution medium, and as well as distribution being effected as far as the reinforcing fibre region, there is impregnation of the reinforcing fibre and, by curing the resin, the end regions are integrally joined.